

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A network for implementing localized roaming of mobile subscribers, comprising:

a Visiting Location Register (VLR) in a contracted roaming network, a Home Location Register (HLR) in a home network, and at least one Roaming Number Manager (RNM) connected with the HLR in the home network;

wherein the HLR in the home network is adapted to inform an RNM corresponding to the current location of a subscriber roaming in the contracted roaming network of subscriber location update upon receiving a request from the VLR in the contracted roaming network;

the RNM is adapted to allocate a local mobile phone number from a pool of local mobile phone numbers in the contracted roaming network for the subscriber, store mapping between the allocated local mobile phone number and the subscriber, and return the allocated local mobile phone number to the HLR in the home network, and wherein the allocated local mobile phone number is adapted to be utilized to process an incoming call or an outgoing call in the contracted roaming network; and

the HLR in the home network is further adapted to send the local mobile phone number in the contracted roaming network to the VLR in the contracted roaming network to be inserted in the VLR.

2. (previously presented) The network for implementing localized roaming of mobile subscribers according to claim 1, wherein said RNM is embedded in said HLR.

3. (previously presented) A method for implementing localized roaming of mobile subscribers based on the network of claim 1, comprising:

a. configuring the RNM with local mobile phone numbers in the contracted roaming network, an independent Public Switched Telephone Network/Integrated Service Digital Network (PSTN/ISDN) number and a signaling point code;

b. configuring data in entities of the contracted roaming network and entities of the home network, so that the subscriber location query message taking a local number in the roaming network as the destination address will be directed to the RNM in the home network;

c. establishing interfaces between the RNM and entities of the contracted roaming network as well as between the RNM and entities of the home network;

d. developing communication services in the roaming network based on the configuration in respective entities of the contracted roaming network and the home network, implementing localized roaming of the subscriber.

4. (previously presented) The method for implementing localized roaming of mobile subscribers according to claim 3, wherein said step c comprises:

c1. establishing an interface between the RNM and an MSC in the roaming network;

c2. establishing an interface between the RNM and the HLR in the home network.

5. (previously presented) The method for implementing localized roaming of mobile subscribers according to claim 3, wherein said step d comprises a subscriber location update process:

d1. sending a location update request from the VLR currently serving the subscriber to the HLR in the home network;

d2. according to the location update request received from the VLR and the current location of the subscriber, addressing the RNM corresponding to the current location of the subscriber through the PSTN/ISDN number of RNM and informing the RNM of the subscriber location update, by the HLR in the home network;

d3. allocating by the RNM a local mobile phone number in the roaming network, to the subscriber, and returning said number to the HLR in the home network;

d4. inserting said local mobile phone number in the roaming network into the VLR currently serving the subscriber, and returning an acknowledgement message of obtaining said number in the roaming network to the RNM, by the HLR in the home network.

6. (previously presented) The method for implementing localized roaming of mobile subscribers according to claim 5, wherein step d3, before allocating a local mobile phone number to the subscriber, further comprises:

determining by the RNM whether the roaming region where the subscriber is roaming is a contracted roaming region;

if so, allocating one from the available numbers in the contracted roaming network and feeding the allocated number back to HLR in the home network by the RNM;

otherwise feeding the mobile phone number of the subscriber in the home network to HLR in the home network.

7. (previously presented) The method for implementing localized roaming of mobile subscribers according to claim 6, wherein:

an incoming call or an outgoing call is processed by using the number fed back from RNM in the home network.

8. (previously presented) The method for implementing localized roaming of mobile subscribers according to claim 5, further comprising:

informing the subscriber of the location update by voice, short message or Unstructured Supplementary Service Data.

9. (previously presented) The method for implementing localized roaming of mobile subscribers according to claim 7, wherein the call is processed by using the number fed back from RNM in the home network in the following manner:

when acting as the caller, the subscriber uses the number fed back from the RNM in the home network to initiate a call;

when the subscriber acts as the called party, if the called number is the mobile phone number in home network, the MSC in the home network queries HLR in the home network to determine the calling route, the HLR finds the corresponding subscriber record, obtains address of VLR currently serving the subscriber, and accesses said VLR to obtain the calling route, with which the HLR instructs the MSC in the home network to establish a calling route;

if the called number is a local mobile phone number in a roaming region, the MSC in the roaming network queries RNM about calling route information, the RNM finds the subscriber identifier, queries the HLR about the calling route information in accordance with the subscriber identifier, and forwards the calling route information returned from HLR to the MSC in the roaming network.

10. (previously presented) The method for implementing localized roaming of mobile subscribers according to claim 5, further comprising:

when the subscriber leaves the contracted roaming network, the HLR in the home network informs the RNM of the subscriber location update, the RNM releases the local mobile phone number, occupied by the subscriber, in the roaming network, and breaks the mapping between the number and the subscriber.

11. (previously presented) The method for implementing localized roaming of mobile subscribers according to claim 10, further comprising:

binding the local mobile phone number in the contracted roaming network to a the subscriber.

12. (previously presented) The method for implementing localized roaming of mobile subscribers according to claim 5, wherein said VLR in step d1 addresses the HLR in the home network in accordance with International Mobile Subscriber Identifier (IMSI) of the subscriber.

13. (previously presented) The method for implementing localized roaming of mobile subscribers according to claim 5, wherein the information carried in the location update request sent from VLR to HLR in step d1 and the parameters carried in the location update informed from HLR to RNM in step d2 comprise:

the IMSI of the subscriber and/or the mobile phone number in the home network, current location of the subscriber and old location of the subscriber.

14. (previously presented) The method for implementing localized roaming of mobile subscribers according to claim 5, wherein the subscriber location update process further comprises:

d5. informing the RNM serving the old location of the subscriber by the HLR in the home region;

d6. if there is no binding relation between the subscriber and the local mobile phone number occupied by the subscriber, releasing said local mobile phone number occupied by the subscriber by the RNM; and

d7. sending a response from the RNM to the HLR in the home network.

15. (previously presented) The method for implementing localized roaming of mobile subscribers according to claim 5, wherein the subscriber location update process further comprises:

sending an acknowledgement for number allocation from the HLR to the RNM serving the current location of the subscriber, after receiving an acknowledgement for subscriber data insertion from the VLR.

16. (previously presented) The method for implementing localized roaming of mobile subscribers according to claim 5, wherein the subscriber location update process further comprises:

if not receiving the acknowledgement for number allocation from the HLR for a determined period, the RNM releasing the allocated number.

17. (previously presented) The method for implementing localized roaming of mobile subscribers according to claim 3, wherein said step d comprises a process for calling the subscriber with the local mobile phone number in the roaming region; said process comprising :

d8. when the call is made to the subscriber with the local mobile phone number in the roaming network, initiating a route query from a GMSC in the roaming network to the RNM currently serving the subscriber;

d9. after receiving the query, the RNM searching for the subscriber identifier according to the local mobile phone number in the roaming network, and querying HLR in home network about the calling route in accordance with the subscriber identifier;

d10. returning the query result from the HLR in the home network to the RNM, which sends an acknowledgement for route query to the GMSC and instructs the GMSC to establish the route with the number obtained from the HLR.

18. (previously presented) The method for implementing localized roaming of mobile subscribers according to claim 3, wherein said step d also comprises a process for calling the subscriber with the mobile phone number in the home network; said process comprising :

d11. when the call is made to the subscriber by using the mobile phone number in the home network, initiating a route query from a GMSC in the home network to the HLR in the home network;

d12. after receiving the query, requesting the VLR currently serving the subscriber to allocate a temporary routing number according to the mobile phone number of the subscriber in the home network by the HLR in the home network;

d13. allocating, by the VLR currently serving the subscriber, a temporary routing number to the subscriber, and returning said temporary routing number to the HLR in the home network;

d14. sending an acknowledgement for route query from the HLR in the home network to the GMSC in the home network, and instructing the GMSC to establish a route with the allocated temporary routing number.

19. (previously presented) The method for implementing localized roaming of mobile subscribers according to claim 3, wherein said step d further comprises a process of sending a short message to the subscriber with the local mobile phone number in the roaming network; said process comprising :

d15. sending a short message from a Short Message Service Center (SC) to a Short Message Service Gateway Mobile Switching Center SMS (GMSC), which initiates a route query to the RNM;

d16. on receiving the query searching for the subscriber identifier according to the local mobile phone number in the roaming network, and querying the HLR in the home network about the route with the subscriber identifier, by the RNM;

d17. returning the MSC number or a Service GPRS Supporting Node (SGSN) number currently serving the subscriber from the HLR in the home network to the RNM;

d18. sending an acknowledgement for route query from the RNM to the SMS GMSC, to instruct the route for the short message with the MSC number or the SGSN number obtained from the HLR in the home network, and issuing the short message by the SMS GMSC.